



Mid-late Holocene climatic changes in the Southwestern Iberian shelf

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Vegetation (pollen analysis) and alkenone-derived Sea Surface Temperature (SST) reconstructions from a southwestern Iberian shelf core (POPEI VC2B) ($36^{\circ}53'12,99''$ N, $8^{\circ}03'57,98''$ W) show orbital and suborbital climate variability at extremely high resolution for the last 6000 years in this region. In particular, the mid-late Holocene is marked by a long-term cooling revealed by the gradual decrease of arboreal pollen (AP) percentages and SST which parallels the general decreasing trend of the $\delta^{18}\text{O}$ isotope composition recorded in Greenland ice records and the decrease of the mid-latitudes summer insolation.

The short-term vegetation changes, reflecting millennial scale climatic variability, are clearly identified in the POPEI VC2B over the last 6000 years. In particular, the basement of this record is marked by the presence of semi-desert plants (Chenopodiaceae, Artemisia and Ephedra) reflecting dry conditions. These particular dry conditions have been detected elsewhere in the southern Iberian Peninsula and in North African records. Following the particularly dry period, there is a decline of semi-desert plants and an increase of Ericaceae and Pinus associated with establishment of an incipient forest of Quercus deciduous type reflecting temperate and humid conditions. This period was followed by a decrease of arboreal pollen percentages, suggesting a relative climate cooling.

Finally, the last 2500/2000 years, are marked by the presence of anthropogenic associations (including Cerealia-type, Plantago lanceolata-coronopus type, and Olea) and are characterized by several vegetation and climate oscillations associated with the Roman Period (RP), the Dark Ages (DA), the Medieval Climatic Anomaly (MCA), and the Little Ice Age (LIA).